

Filters Water & Instrumentation

Conversion Factors



TOTAL DISSOLVED SOLIDS TABLE			
Conductivity MS/cm ²	Resistivity Meg-Ohm/ cm ²	TDS Mg/L (CaCO ₃)	TDS GPG
0.056	18.000	0.028	0.002
0.063	16.000	0.031	0.002
0.071	14.000	0.036	0.002
0.083	12.000	0.042	0.002
0.100	10.000	0.050	0.003
0.133	7.500	0.067	0.004
0.200	5.000	0.100	0.006
0.500	2.000	0.250	0.015
1.000	1.000	0.500	0.029
1.333	0.750	0.667	0.039
2.000	0.500	1.000	0.058
4.000	0.250	2.000	0.117
10.000	0.100	5.000	0.292
20.000	0.050	10.000	0.585
40.000	0.025	20.000	1.170
80.000	0.013	40.000	2.339
100.000	0.01000	50.000	2.924
200.000	0.00500	100.000	5.848
500.000	0.00200	250.000	14.620
1000.000	0.00100	500.000	29.240
2000.000	0.00050	1000.000	58.480
5000.000	0.00020	2500.000	146.199
10000.000	0.00010	5000.000	292.398

Total Dissolved Solids

One of the important measures of water quality is the amount of dissolved minerals in the water which is called Total Dissolved Solids(TDS). TDS is typically measured by devices which quantify how the water sample conducts an electrical current. All the measurements with the exception of the GPG figures are electrical measurements. The different units are used to make it convenient to express the Total Dissolved Solids(TDS) values.

The most important thing to remember is that the all the units measure the same thing and are all done by electrical current conduction. The measuring instrument's internal electronics make the conversions to the unit of measurement shown on the dial.

Chart Definitions

Conductivity is measured in MS/cm² which is Micro-Siemans per Square Centimeter. This measurement is used more commonly for Untreated City Water and often in Cooling Tower and Boiler Water Conductivity.

Resistivity is measured in Meg-Ohm/cm² which is Million Ohms per Square Centimeter. This measurement is used commonly in Treated Deionized or RO/DI Water Systems for High Purity Applications. The reason that Resistivity is used is that Conductivity at High Purity results in low readings which are difficult to discern.

TDS, measured in Mg/L, translates to dissolved Milligrams per Liter of solution. To make sense out of all the different measurement units, we try to convert them all to this unit.

TDS, measured in GPG, translates to dissolved Grains per Gallon of solution. This is the old avoirdupois system in Grains, ounces, pounds and tons. It is commonly used to measure water hardness and resin capacities in Grains per Cubic Foot(FT³) of Resin.

Other Conversion Factors for Water Treatment

- One (1) Cubic Foot equals 7.48 US Gallons.
- One (1) Cubic Foot equals 28.32 Liters.
- One (1) US Gallon 3.785 Liters.
- One (1) Liter equals 2.2 Pounds.
- One (1) Liter equals 61.03 Cubic Inches.
- One (1) Cubic Foot equals 1,728 Cubic Inches..
- One (1) US Gallon equals 8.33 Pounds.
- One (1) Grain per Gallon equals 17.1 PPM.
- One (1) PSI equals 2.307 feet of head for water.

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Conversion Factors



POUNDS OF ANYTHING PER DAY VARIOUS CONCENTRATIONS													
Water Flow Rate	Water GPD	Water Pounds Per Day	Concentration in PPM										
			0.5	1	1.5	2	2.5	3	4	5	10.0	50.0	100.0
1	1,440	11,991	0.01	0.01	0.02	0.02	0.03	0.04	0.05	0.06	0.1	0.6	1.2
5	7,200	59,954	0.03	0.06	0.09	0.12	0.15	0.18	0.24	0.30	0.6	3.0	6.0
10	14,400	119,909	0.06	0.12	0.18	0.24	0.30	0.36	0.48	0.60	1.2	6.0	12.0
20	28,800	239,818	0.12	0.24	0.36	0.48	0.60	0.72	0.96	1.20	2.4	12.0	24.0
30	43,200	359,726	0.18	0.36	0.54	0.72	0.90	1.08	1.44	1.80	3.6	18.0	36.0
40	57,600	479,635	0.24	0.48	0.72	0.96	1.20	1.44	1.92	2.40	4.8	24.0	48.0
50	72,000	599,544	0.30	0.60	0.90	1.20	1.50	1.80	2.40	3.00	6.0	30.0	60.0
100	144,000	1,199,088	0.60	1.20	1.80	2.40	3.00	3.60	4.80	6.00	12.0	60.0	119.9
200	288,000	2,398,176	1.20	2.40	3.60	4.80	6.00	7.19	9.59	11.99	24.0	119.9	239.8
300	432,000	3,597,264	1.80	3.60	5.40	7.19	8.99	10.79	14.39	17.99	36.0	179.9	359.7
400	576,000	4,796,352	2.40	4.80	7.19	9.59	11.99	14.39	19.19	23.98	48.0	239.8	479.6
500	720,000	5,995,440	3.00	6.00	8.99	11.99	14.99	17.99	23.98	29.98	60.0	299.8	599.5
750	1,080,000	8,993,160	4.50	8.99	13.49	17.99	22.48	26.98	35.97	44.97	89.9	449.7	899.3
1,000	1,440,000	11,990,880	6.00	11.99	17.99	23.98	29.98	35.97	47.96	59.95	119.9	599.5	1199.1
1,250	1,800,000	14,988,600	7.49	14.99	22.48	29.98	37.47	44.97	59.95	74.94	149.9	749.4	1498.9
1,500	2,160,000	17,986,320	8.99	17.99	26.98	35.97	44.97	53.96	71.95	89.93	179.9	899.3	1798.6
1,750	2,520,000	20,984,040	10.49	20.98	31.48	41.97	52.46	62.95	83.94	104.92	209.8	1049.2	2098.4
2,000	2,880,000	23,981,760	11.99	23.98	35.97	47.96	59.95	71.95	95.93	119.91	239.8	1199.1	2398.2

Pounds of Anything - Chart Above

We initially used the above chart to determine the size of Ozonators in Pounds per day when we had a known flow rate in Gallons per Minute(GPM) and/or gallons per day of water consumed. We have since decided to use the chart for other very practical reasons.

If we happen to know a concentration or a suspected concentration of something in water, the chart gives us a common sense way to determine if our assumptions are correct.

Assume a water flow rate of 100 GPM and a contaminant concentration of 10 PPM. After one full day(24 Hours) of flow we will have seen 1,199,088 pounds of water. Running down the 10.0 PPM Concentration row we see that we would have 12 pounds of the contaminant. One gallon is 8.327(See Conversion Factors on the other side of this sheet) pounds, so we would have 1-1/2 Gallons of contaminant. Is this practical? Is what we have selected big enough to remove that much material? Do these assumptions make sense?

Try this chart. It is disarmingly useful.

PARTICLE SIZE CONVERSIONS - MESH/MICRON EQUIVALENTS							
US Mesh	Inches	Microns	Milli-Meters	US Mesh	Inches	Microns	Milli-Meters
3	0.2650	6730	6.730	40	0.0165	420	0.420
4	0.1870	4760	4.760	45	0.0138	354	0.354
5	0.1570	4000	4.000	50	0.0117	297	0.297
6	0.1320	3360	3.360	60	0.0098	250	0.250
7	0.1110	2830	2.830	70	0.0083	210	0.210
8	0.0937	2380	2.380	80	0.0070	177	0.177
10	0.0787	2000	2.000	100	0.0059	149	0.149
12	0.0661	1680	1.680	120	0.0049	125	0.125
14	0.0555	1410	1.410	140	0.0041	105	0.105
16	0.0469	1190	1.190	170	0.0035	88	0.088
18	0.0394	1000	1.000	200	0.0029	74	0.074
20	0.0331	841	0.841	230	0.0024	63	0.063
25	0.0280	707	0.707	270	0.0021	53	0.053
30	0.0232	595	0.595	325	0.0017	44	0.044
35	0.0197	500	0.500	400	0.0015	37	0.037

Particle Size Conversions - Chart Above

This is a standard but handy chart which shows equivalencies between US Mesh, Inches, Microns and Millimeters. Different Filters use different units for ratings.

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